

CLAIMS

WE CLAIM:

1. A method for measuring the mass of plant structures supported on a support wire of a trellis structure, the method comprising:  
measuring the tension of the support wire and  
translating the tension of the support wire into the mass of the plant structures supported on the support wire.
2. The method of claim 1, wherein the tension of the support wire is measured with at least one load cell placed in-line with the support wire.
3. The method of claim 2, wherein translating the tension of the support wire into the mass of the plant structures supported on the support wire includes correcting the tension of the support wire to account for environmentally-induced thermal expansion and contraction of the support wire.
4. The method of claim 1, wherein the plant structures include a harvestable crop and the method further comprises determining the mass of the harvestable crop from the tension of the support wire.
5. The method of claim 1, wherein:  
the plant structures include fruit and vegetation; and  
the method further comprises determining the mass of fruit supported on the support wire.
6. The method of claim 1, further comprising estimating the crop yield at harvest from the tension of the support wire.

7. A method for measuring the mass of plant structures supported on a trellis structure, the method comprising:
- connecting a tension-measuring device to the trellis structure such that the tension measuring device is operable to measure the tension of a wire of the trellis structure;
  - measuring the tension of the wire; and
  - determining the mass of the plant structures from the tension of the wire.
8. The method of claim 7, further comprising connecting a tension adjuster to the wire for increasing or decreasing the tension of the wire.
9. The method of claim 7, further comprising measuring the temperature of the wire and correcting the tension to account for thermal expansion or contraction of the wire.
10. The method of claim 7, wherein:
- the plant structures comprise vegetation and a crop; and
  - the method further comprises determining the mass of the crop supported on the trellis structure from the tension of the wire.
11. A method for measuring the load induced on a trellis structure by plant structures, comprising the steps of:
- (a) measuring the tension in a support wire of the trellis structure; and
  - (b) translating said tension in the support wire into the mass of the plant structures.
12. The method of claim 11, wherein the tension in the support wire is measured with a load cell.
13. The method of claim 11, further comprising estimating the crop yield of the plant structures at harvest from the load induced on the trellis structure.

14. A system for measuring the mass of living plant structures supported on a trellis structure, comprising a tension-measuring device adapted for coupling to a wire of the trellis structure, the tension-measuring device being operable to measure the tension of the wire and to generate a signal corresponding to the tension of the wire.

15. The apparatus of claim 14, further comprising a controller operatively connected to the tension-measuring device, the controller being operable to receive the signal from the tension-measuring device and to automatically translate the tension into the mass of the plant structures.

16. The apparatus of claim 15, wherein the tension-measuring device comprises a load cell.

17. The apparatus of claim 15, wherein the tension-measuring device comprises a strain gauge.

18. The apparatus of claim 15, further comprising a tension adjuster adapted to be coupled to the wire for adjusting the tension of the wire.

19. A trellis apparatus for supporting plant structures, comprising:  
first and second end posts;  
one or more intermediate posts positioned between the end posts, each intermediate post having a pulley;  
a support wire extending between the end posts and supported on the pulleys of the intermediate posts;  
means to measure tension in said support wire; and  
means for converting said tension measurements into information useful for predicting yield.

20. The trellis apparatus of claim 19, wherein said means to measure tension in said support wire is a load cell.
21. The trellis apparatus of claim 20, further comprising a tension adjuster coupled to the support wire and adapted to increase and decrease the tension of the support wire.